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1. Introduction

Transmission Projects Delivery (TPD) is an Eskom Transmission Division business unit. TPD’s mandate is to play a critical role in terms of the construction of new transmission power lines (400kV and 765kV) and substations as well as upgrades of existing power lines and substations as well as telecommunication towers across South Africa. TPD also gets involved in the construction of 132kV and 275kV lines and substations where required by its client. TPD comprises of six portfolios.

TPD Waste Management Plan (WMP) is a document that details goals and programmes for the management of waste in a manner that meets Eskom requirements and complies with all legislative requirements.

The plan also recommends possible methods that can be used in the collection, transportation of waste to disposal and processing facilities. Effective waste management is critical in ensuring the prevention of pollution, ecological degradation and reduction of the environmental footprint. An integrated approach is also required to minimise and manage all waste streams and the associated risks in an environmentally acceptable and cost-effective manner. TPD will manage waste in a responsible manner through the identification and proactive management practices of waste. This commitment is based on the waste management principles (as shown in Figure 1: Waste hierarchy) that embody avoidance of waste generation, and where avoidance is not possible, promote the conservation of resource use through effective and efficient resource utilisation, minimisation, reuse, recycling and the disposal of the remaining waste.



Figure 1: Waste

Hierarchy

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One could acknowledge that as the lead environment agency, Department of Forestry, Fisheries and Environment (DFFE) has made remarkable progress in harmonising South Africa's environmental and/ or waste management legislation and policy, both at the international and national scales. All main environmental and/or waste management legislation makes reference to the Constitution of South Africa, 1996 (Act 108 of 1996). The Constitution enshrines both the Bill of Rights and the legal basis for distributing powers to the three spheres of government. Section 24 (RSA 1996: 10-11) stipulates that:

Everyone has the right (a) to an environment that is not harmful to their health or wellbeing; and (b) to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that (i) prevent pollution and ecological degradation, (ii) promote conservation, and (iii) secure ecological sustainable development and the use of natural resources while promoting justifiable economic and social development. Already, issues relating to health, pollution and waste are implicitly inclined towards the institutions that deal with the environment rather than health.

The National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM: WA), was promulgated on 1 July 2009 and the National Environmental Management: Waste Amendment Act 2014 followed in June 2014 which brought about changes in the NEM:WA. The NEM:WA is the main legislation which governs waste management in South Africa.

The following updates were made to waste related legislation since this document was last updated:

- 18 July 2018 – NEM:WA: Regulations regarding the exclusion of a waste stream or a portion of a waste stream from the definition of waste (G 41777 GoN 715).
- 14 May 2020 – Disaster Management Act 57 of 2002 (DMA): Directions regarding measures to address, prevent and combat the spread of COVID-19 in relation to recycling of waste sectors (G 43324 GN 539).
- 26 October 2020 – NEM:WA: Notice of intention to take a decision on applications for the exclusion of a waste stream or portion of such a stream for beneficial use from the definition of waste (G 43847 GoN 1145).
- 5 November 2020 – NEM:WA: Regulations regarding extended producer responsibility (G 43879 GoN 1184).
- 5 November 2020 – NEM:WA: Extended producer responsibility scheme for the electrical and electronic equipment sector (G 43880 GoN 1185).

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- 15 January 2021 – NEM:WA: Amendment of the regulations and notices regarding extended producer responsibility (G 44078 GoN 20).

TPD generates various waste types depending on the nature of operations. Some of the waste types generated include domestic waste (plastics, papers, food waste), building/concrete rubble, used oils, oil contaminated soil, scrap metals, electronic waste (cartridges and scrap computers), etc.

The WMP extends over the entire waste cycle from cradle to grave, and covers generation, collection, transportation, treatment, storage, classification and final waste disposal. It is a move away from traditional approaches of management of environmental impact and remediation to establishing a waste management system, which focuses on waste prevention and minimisation. This document shall be implemented, monitored and audited in order to ensure continual improvement of waste management performance across TPD projects and associated activities. It is also produced in order to have standardisation of the process and activities related to waste management across TPD. The Plan will be reviewed when the need arises and/or there is a change in scope or nature of the business to ensure continued relevance and effectiveness, and compliance will be measured through audits and inspections.

2. Background

TPD is in support of government's commitment to waste management in order to protect health and ensuring the protection of South Africa's environment. This is defined specifically in the National Waste Management Strategy, NEMA, and in particular the NEM: WA. In response to the provisions of Part 7 of the NEM: WA TPD has committed and further developed a Waste Management Plan. For guidance, the Department of Environmental Affairs Guideline Document is used.

The focus of the plan is to prevent and minimise waste generation at the source in order to protect human health and the environment and to utilise resources in a sustainable manner.

In order to assist in the implementation of the waste management principles, Eskom Waste Management Procedure 32-245 has been adopted and is in use by both Eskom TPD employees and contractors. As per Eskom's procedural requirements, a Waste Management Plans (WMP) that embodies the principles of waste management shall be developed and implemented.

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3. Supporting Clauses

3.1 Scope

3.1.1 Purpose

The purpose of this document is to establish a common standard for the management of waste generated in TPD. It will serve as a mechanism to comply with the relevant legislation and Eskom requirements.

3.1.2 Applicability

This document shall apply throughout TPD project sites including contractors and excluding all offices where TPD personnel are housed (i.e. Megawatt Park), and where waste management activities are handled by Eskom Real Estate.

3.2 Normative/Informative References

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

3.2.1 Normative

- [1] 32-727: Eskom Safety, Health, Environmental and Quality Policy
- [2] 32-245: Eskom Waste Management Procedure
- [3] 32-249: Eskom Environmental Liaison Committee (ELC) Performance Indicator Reporting Procedure
- [4] 32-404: Health Care Risk Waste Management Procedure
- [5] 32-303: Asbestos Procedure
- [6] TPDMAN-WN-94 Performance, Monitoring, Measurement, Analysis and Evaluation
- [7] PDPMAN-MN-03 PDP Environmental Management System Manual
- [8] PDPMAN-SG-68 PDP SHEQ Statement of Commitment

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3.2.2 Informative

- [1] National Environmental Management Act (Act 107 of 1998)
- [2] Hazardous Substance Act (Act 15 of 1973)
- [3] ISO 14001 Environmental Management System – Requirements with guidance for use
- [4] National Waste Management Strategy (NWMS)
- [5] National Environmental Management: Waste Act (Act 59 of 2008)
- [6] National Environmental Management Waste Amendment Act (Act 26 of 2014)

3.3 Definitions

All definitions below are as defined in NEMA and NEM:WA. All other definitions shall be interpreted as presented in the ISO Standards.

3.3.1 “building and demolition waste” means waste, excluding hazardous waste, produced during the construction, alteration, repair or demolition of any structure, and includes rubble, earth, rock and wood displaced during that construction, alteration, repair or demolition, which include:

- (a) discarded concrete, bricks, tiles and ceramics;
- (b) discarded wood, glass and plastic;
- (c) discarded metals;
- (d) discarded soil, stones and dredging spoil;
- (e) other discarded building and demolition wastes.

3.3.2 “business waste” means waste that emanates from premises that are used wholly or mainly for commercial, retail, wholesale, entertainment or government administration purposes.

3.3.3 “disposal” means the burial, deposit, discharge, abandoning, dumping, placing or release of any waste into, or onto, any land.

3.3.4 “domestic waste” means waste, excluding hazardous waste, that emanates from premises that are used wholly or mainly for residential, educational, health care, sport or recreation purposes, which include:

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- (a) garden and park wastes;
- (b) municipal waste;
- (c) food waste.

3.3.5 “environment” has the meaning assigned to it in section 1 of the National Environmental Management Act.

3.3.6 “general waste” means waste that does not pose an immediate hazard or threat to health or to the environment, and includes —

- (a) Domestic waste;
- (b) Building and demolition waste;
- (c) Business waste; and
- (d) Inert waste; or
- (e) any waste classified as non-hazardous waste in terms of the regulations made under section 69, and includes non-hazardous substances, materials or objects within business, domestic, inert, building and demolition wastes as outlined in Schedule 3, Category B of the NEM: Waste Amendment Act.

3.3.7 “hazardous waste” means any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment and includes hazardous substances, materials or objects within business waste, residue deposits and residue stockpiles as outlined in Schedule 3, Category B of the NEM: Waste Amendment Act.

3.3.8 “health care risk waste” is a subcategory of hazardous waste and includes human and animal anatomical waste, infectious human and animal waste, sharps, chemical waste, pharmaceutical waste and radioactive waste generated by healthcare professionals, healthcare facilities and other non-health-care professionals, for example, funeral parlour directors, tattooists, and traditional healers.

3.3.9 “healthcare general waste” categories include: packaging material, kitchen waste (domestic waste) office waste and building demolition waste, waste from patients, non-clinical glass, non-infectious waste, non-anatomical waste (for example paper tissues), disposable curtains, nail clippings, hair, decontaminated waste, and garden and park waste.

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3.3.10 “holder of waste” means any person who imports, generates, stores, accumulates, transports, processes, treats, or exports waste or disposes of waste.

3.3.11 “inert Waste “means waste that -

(a) does not undergo any significant physical, chemical or biological transformation after disposal;

(b) does not burn, react physically or chemically biodegrade or otherwise adversely affect any other matter or environment with which it may come into contact; and

(c) does not impact negatively on the environment, because of its pollutant content and because the toxicity of its leachate is insignificant and which include:

(a) discarded concrete, bricks, tiles and ceramics;

(b) discarded glass;

(c) discarded soil, stones and dredging spoil.

3.3.12 “minimisation” means when used in relation to waste, means the avoidance of the amount and toxicity of waste that is generated and, in the event where waste is generated, the reduction of the amount and toxicity of waste that is disposed of.

3.3.13 “recovery” means the controlled extraction or retrieval of any substance, material or object from waste.

3.3.14 “recycle” means a process where waste is reclaimed for further use, which process involves the separation of waste from a waste stream for further use and the processing of that separated material as a product or raw material.

3.3.15 “re-use” means to utilise the whole, a portion of or a specific part of any substance, material or object from the waste stream for a similar or different purpose without changing the form or properties of such substance, material or object.

3.3.16 “storage” means the accumulation of waste in a manner that does not constitute treatment or disposal of that waste.

3.3.17 “treatment” means any method, technique or process that is designated to –

(a) change the physical, biological or chemical character of composition of a waste; or

(b) remove, separate, concentrate or recover a hazardous or toxic component of a waste; or

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(c) destroy or reduce the toxicity of a waste,

in order to minimise the impact of the waste on the environment prior to further use or disposal.

3.3.18 “waste” means

(a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to the NEM: Waste Amendment Act, or

(b) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette,

but any waste or portion of waste, referred to in paragraphs (a) and (b) above, ceases to be a waste –

(i) once an application for its re-use, recycling or recovery has been approved or, after such approval, once it is, or has been re-used, recycled or recovered;

(ii) where approval is not required, once a waste is, or has been re-used, recycled or recovered;

(iii) where the Minister has, in terms of section 74 of the NEM Waste Amendment Act, exempted any waste or a portion of waste generated by a particular process from the definition of waste; or

(iv) where the Minister has, in the prescribed manner, excluded any waste stream or portion of a waste stream from the definition of waste.

3.3.19 “waste disposal facility” means any site or premise used for the accumulation of waste with the purpose of disposing of that waste at that site or on that premise.

3.3.20 “waste management activity” means any activity listed in Schedule 1 of the NEMWA or published by notice in the Gazette under section 19, and includes –

(a) the importation and exportation of waste;

(b) the generation of waste, including the undertaking of any activity or process likely to result

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in the generation of waste;

- (c) the accumulation and storage of waste;
- (d) the collection and handling of waste;
- (e) the reduction, re-use, recycling and recovery of waste;
- (f) the trading in waste;
- (g) the transportation of waste;
- (h) the transfer of waste;
- (i) the treatment of waste; and
- (j) the disposal of waste.

3.3.21 “waste minimisation programme” means a programme that is intended to promote the reduced generation and disposal of waste.

3.3.22 “waste transfer facility” means a facility that is used to accumulate and temporarily store waste before it is transported to a recycling, treatment or waste disposal facility.

3.4 Abbreviations (Table 1)

Abbreviation	Explanation
BU	Business Unit
CFL	Compact Fluorescent Lamps
DFFE	Department of Forestry, Fisheries and Environment
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
ELC	Environmental Liaison Committee
EMPr	Environmental Management Programme
GN	Government Notice
IndWMP	Industrial Waste Management Plan
H: H	High hazard
MSDS	Material Safety Data Sheets

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Abbreviation	Explanation
NEMA	National Environmental Management Act (Act 107 of 1998)
NEM:WAA	National Environmental Management Waste Amendment Act (Act 26 of 2014)
NEM:WA	National Environmental Management: Waste Act (Act 59 of 2008)
PCB	Polychlorinated Biphenyl
SHE	Safety, Health and Environment
TPD	Transmission Projects Delivery
WMP	Waste Management Plan

3.5 Roles and Responsibilities

3.5.1 Contractor

- Compile a project specific WMP that shall be reviewed by Eskom.
- Appoint competent personnel (i.e. as per TPDMAN-ST-37) to ensure compliance to this plan and other related requirements in this regard.
- Set waste management targets for reduction, reuse, recycling, and general waste recycling.
- Monitor performance against targets and be in a position to explain negative variances.
- Submit periodic reports to TPD regarding compliance to project specific WMPs.
- Continually review project specific WMPs to ensure relevance and effectiveness.

3.5.2 Transmission Projects Delivery

- Ensure that the waste management practices conform with Eskom Waste Management Standard and any other Compliance Obligations.
- Provide overall TPD WMP to the contractor.
- Ensure that TPD WMP requirements are understood by contractor.
- Monitor contractor performance against its targets and TPD targets and report trends.
- Provide support and advice to contractors on waste management issues.

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3.6 Process for Monitoring

The detailed monitoring process requirements are through TPD Management meetings, Project Review Management meetings, TPD Grids Management Meetings, TPD SHEQ Management Review Committee meetings, TPD SHEQ Department meetings & TPD EMC meetings, Site Progress Meetings, Audits and Inspections, and is not limited to this list.

3.7 Related/Supporting Documents

- (1) 240-47176064 Waste Monthly Register
- (2) TPDMAN-ST-37 Environmental Requirements for Contractors/Suppliers - specific items related to waste management

4. Document Content

4.1 Legal Framework

The underlying overarching framework for waste management is that, the generator is accountable and responsible for waste from cradle to grave. Waste management is one of those areas that is mostly governed by a single piece of legislation i.e. NEM: WA although there are others that support it.

Section 24 of the Constitution focuses on the Constitutional right to an environment that is not harmful to human health or well-being. In South Africa, there are a number of legislations that address waste management (generation, handling, transportation, treatment, and disposal). This makes it critical to develop and implement a WMP that is in compliance to the legislation addressing all three spheres of government (national, provincial and local).

4.2 Waste Management objectives and strategies

The overarching objective of waste management for the TPD is to ensure that all waste is managed appropriately, capitalising on processes that prevent, minimise, reduce, recover and recycle. This contributes to ensuring that risks of exposing employees, the public and the impact on the environment are prevented and if not, minimised.

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4.2.1 The specific objectives and targets of waste management in the TPD are as follows:

- To ensure that interfaces for waste management are clearly defined and understood by management and staff.
- To establish a standardised approach towards waste management in TPD.
- To monitor waste generation in a bid to reduce waste generated over extended periods.
- To stipulate expectations to all parties doing work on behalf of TPD.

5. Waste Planning

Waste management planning involves the identification of waste types that shall be generated, classification of the waste into waste streams, estimation of waste quantities and the proposal of strategies for waste reduction.

5.1 Waste streams and Types

According to the Schedule 3: Defined Wastes in the NEM: WA, waste is classified as Hazardous Waste (Category A) and General Waste (Category B).

TPD generates its waste from activities such as office administration and power lines and substation construction. The waste types identified from TPD fall under the categories of Category A and Category B waste. The bulk of waste produced by TPD is predominantly general waste hence the need for a proper management system.

5.1.1 General Waste

The waste types identified under this stream are generated from activities such as site/office establishment and operation, vegetation clearing, excavations, tower assembly etc. They include garden waste, excess soil (spoil), building rubble and scrap metal, food wastes and re-usable/recyclables such as glass, paper, plastics, and tins, cardboard, wood and waste tyres. In most instances, general waste is temporarily stored in bins / skips prior to removal by contractors to off-site general waste recyclable centres and/or disposal facilities.

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5.1.2 Hazardous Waste

Hazardous waste varies significantly in nature, composition, size and the severity of risks and harmfulness to people and the environment. These wastes include: asbestos containing materials from old buildings and insulation, medical waste, fabric filters, fluorescent tubes, batteries, printer cartridges, paint tins, PCB containing oils, used oil and car parts from workshops, silica gel from transformers, used oil, grease and lastly oil contaminated waste which consists of oily rags used for wipe-ups and old PPE and oil contaminated soils from leakages and spillages. In general, hazardous waste is stored at on-site hazardous waste storage areas before being removed by contractors, which are registered as hazardous waste transporters, and disposed of at a licensed H:H waste disposal facilities.

5.1.3 Medical/Health Care Waste

The activities that lead to the generation of this type of waste are from first aid incidents and employees wounded on sites or at offices. All medical waste shall be handled according to legal and Eskom requirements. The current practices within TPD operations are that the contractors make arrangements with the medical facilities (clinics and hospitals) around their area of operations.

5.1.3.1 COVID-19 related waste

There are two types of health care waste, healthcare risk waste and healthcare general waste.

Healthcare risk waste must be treated as medical waste and requires special disposal. This relates to COVID-19 type of waste generated from people in medical centres, in isolation or in quarantine. This waste must be treated in terms of SANS 102480-1. All healthcare waste produced during patient care, irrespective of whether that patient is a confirmed COVID-19 case or not, is considered to be infectious.

Healthcare general waste must be treated as normal domestic waste disposal. This relates to COVID-19 type of waste generated from offices and homes of unknown COVID-19 infections. COVID-19 type waste generated from areas not known to be contaminated by COVID-19 including offices, workplace areas or at homes can be classified as non-hazardous and should be disposed of by municipal waste services.

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5.2 Waste Types

Table 2 below indicate waste streams and types that are generated within TPD

WASTE STREAMS AND WASTE TYPES
GENERAL WASTE
<ul style="list-style-type: none"> • Cement bags (washed) • Paper • Heat Treated Wood • Uncontaminated Plastic • Cans / Tins • Bottles • Healthcare general waste • Waste Tyres • Scrap Metal • Building and Demolition Rubble (Not Contaminated with hazardous substances) • Organic waste (i.e. garden waste, other wood materials)
HAZARDOUS WASTE
<ul style="list-style-type: none"> • Oil, Transformer Oil • Oil contaminated soil and waste • Solvents • Cement • Cement bags (unwashed) • Contaminated soil • Fluorescent tubes

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- Conductor drums (treated with hazardous substances)
- Wood (treated with hazardous substances)
- Medical Waste
- Healthcare risk waste
- SF6
- Spare mechanical parts
- Metal coated with hazardous substances
- Contaminated Building Rubble/dry concrete
- Wet Concrete
- E-Waste (incl. Printer cartridges and computers)
- Paint tins and cans
- Asbestos and asbestos containing material
- Herbicides and herbicides containers
- Grey water and sewerage

MEDICAL WASTE

- Waste generated after first aid treatments/applications

5.3 Estimates of waste quantities

The contractors shall record waste quantities generated and disposed of. Further, records relating to the safe disposal of waste shall be kept at all times. Both waste quantities and safe disposal records must be sent to the Project Senior Environmental Advisors once received or on a monthly basis. Copies of service provider/s waste permit/s shall be kept on sites, if the contractors do not dispose of the waste themselves. Records of waste quantities must be done as per 240-47176064 Waste Monthly Register (minimum requirement).

The following table illustrates the trend on the waste quantities recorded from previous financial years.

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Table 3: Waste Quantities generated from Previous FYs recorded in TPD 2020/21

Waste	Quantities/volumes generated	Re-use/Recycled Quantities	Means of Disposal
Hazardous			
Sewerage, Grey-water and Contaminated Effluent	385 326 litres	-	Waste Water Treatment Plants
Used Oil	2000 litres	2000 litres	Oil Recycling Service Providers
Asbestos and Medical Waste	-	-	Hazardous Landfill sites and, Medical Centres (clinics and hospitals)
Oil contaminated soil	3740 kg	-	Hazardous Landfill sites
Oil contaminated waste	12 m ³ 9500 kg	-	Hazardous Landfill sites
E-waste	-	-	Recycling Service Providers
Chemical containers chemicals	440 kg	-	Hazardous Landfill sites
Mixed hazardous waste	-	-	Hazardous Landfill sites
General waste			
Domestic waste	122 m ³ 124534 kg	149 kg	General landfill Sites

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Construction and demolition waste	197 m ³ 164 380 kg	110 m ³	General landfill Sites and donated to local communities or land owners
Garden refuse	-	-	General landfill Sites
Wood	70 m ³ 67 426 kg	70 m ³ 67 426 kg	Donated to local communities
Metals	16 742.28 kg	16 742.28 kg	Scrap yards and Eskom Internal Departments
Paper	24.5 kg	24.5 kg	Recycling centres
Plastic	3.18 kg	3.18 kg	Recycling centres

6. Waste Management Principles

As part of WMP implementation, there are a number of waste management principles that TPD considers:

6.1 Prevention and Minimization

This refers to the reduction of the volume of waste during production by means of different processes or clean technology.

Waste avoidance, i.e. reducing waste without relying on recycling or re-use, is the most economically and environmentally beneficial waste minimisation option. Waste minimisation intends to avoid creation of waste before it is produced and reduce its quantity and toxicity. Prevention is the primary goal, followed by reuse, recycling, treatment and appropriate disposal.

The following preventative and/or minimisation measures shall be employed:

- Ensure Compliance to Eskom TPD WMP and Procedures;
- Regular waste management awareness training;
- Avoid having and using excess materials on sites;
- Ensure that all project sites (contractors) have waste management method statements or WMP;
- Take back schemes where an industry must take back the product when it becomes a waste;

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- Print on both sides of the paper; and
- If it is possible, avoid printing and instead store documents electronically.

The Table 4 below illustrates the prevention and minimisation principles initiatives.

Table 4: Prevention and Minimisation principles

Instead of.....	Try this.....
Paper lunch bags	A re-usable, washable bag or lunch box
Baggies, plastic wrap, aluminium foil	A re-usable container
A regular pencil	A mechanical pencil
Paper / plastic cups	Bring a washable cup
Paper memos/ reports	Use e-mail
Single sided copies	Make all double sided copies where possible
Use virgin paper in fax machines	Re-use the blank side of bad copies, if needed you can make a clean copy later
Buying new scratch pads/paper	Re-use the other side of excess documents
Multiples of the same subscription	Share one copy with other personnel

6.2 Precautionary Measures

The following precautionary measures shall be employed:

- Procure the exact amount of resources and in bulk packages in order to avoid excess materials that may be wasted;
- Ensure that good quality materials (steel, concrete, disposable eating or drinking containers) are purchased to avoid defect materials that may easily be rendered not fit for use; and
- Good housekeeping practices.

6.3 Reduce Reuse and Recycle

There are a number of waste types that TPD generates that can be reduced, reused and recycled. Reducing is all about among others, oil contaminated soil and waste that can be reduced by making sure that construction vehicles are maintained and free of oil leaks.

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The following reduce; reuse and recycle measures shall be employed:

- Form a relationship with the waste recycling companies located in and around the project areas;
- Set targets for specific waste streams;
- Packaging material (i.e. conductor drums and insulator boxes) to be given back to supplier or to communities for re-use; and
- Recycling of paper is important, so is recycling of ink cartridges.

6.4 Temporary Storage

TPD temporarily stores its waste from the point of generation daily and then takes it to the camp sites/project sites offices where it is transferred into bins or skips. The following storage and disposal measures shall be employed:

- All waste shall be stored in suitable waste containers;
- All waste receptacles shall be labelled or colour coded so as to ensure that the waste separation and recycling / re-use / disposal requirements are met;
- All waste containers (drums, bins and/or skips) shall be cleaned on a regular basis and records of service shall be maintained in the contractors site file;
- All storage areas shall be demarcated so as to ensure that access is controlled;
- The contractor shall maintain accurate records on file of the volumes / weights of waste streams and date of disposal;
- All hazardous waste shall be stored in sealable impermeable, containers / skips or banded containment structures; and
- All storage containers / skips and bunds shall be maintained to ensure that the risk of polluting the surrounding natural environment is prevented.

6.5 Disposal

- Only registered and/or accredited service providers shall be used for collection, transportation and disposal of hazardous waste.
- All waste generated shall be disposed of according to its classification and only at a registered landfill site.
- The contractor shall ensure that a removal manifest is obtained from the service provider.

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- The contractor shall ensure that the service provider issues a weigh bridge slip together with a Safe Disposal Certificate within the required time frames of the removal from site.
- The contractor shall maintain a waste register and attach all relevant proof of disposal documentation.
- All waste generated shall be classified and disposed of within 18 months as per legal requirements.

6.6 Waste Classification according to NEM: WA

6.6.1 Waste Classification

Waste generated must be classified in accordance with the Waste Classification and Management Regulations (GNR 634). This classification system shall be done in accordance with the latest edition of SANS 10234: Globally Harmonized System (GHS) within one-hundred-and-eighty (180) days of generation. All waste generated and fit the classification as in GNR 634 shall have Safety Data Sheets prepared.

6.6.1.1 General and Business / Domestic Waste

These waste types fall within Annexure 1 of GNR634, and there is no need to classify these waste streams in terms of SANS 10234. The majority of these waste streams will be designated to be re-used, recycled or recovered. See Table 5 below as an example of this.

Table 5: General and Domestic waste classification examples.

Waste Type	Waste Classification
Office kitchen waste	General / Business Solid Waste
Office paper waste	General / Business Solid Waste
Office – other waste i.e. packaging, plastic,	General / Business Solid Waste
Litter and domestic waste in construction camp	General / Business Solid Waste
Scrap Metal	General Solid Waste
Wood packaging waste	General Solid Waste

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Scrapped line hardware waste	General Solid Waste
Plastic	General / business Solid Waste
Building Rubble	General Solid Waste
Washed/soaked cement bags	General / business Solid Waste

6.6.1.2 Hazardous Waste

TPD does not generate waste that may need classification at source since all generated waste fall under Annexure 1 (2). Should that happen, SANS 10234 shall be used. For the purposes of the GHS (SANS 10234), the classification of substances and mixtures incorporates the following:

- Identification of the relevant data regarding the hazards;
- Subsequent review of the data to ascertain the associated hazards; and
- A decision on whether the substance or mixture is classifiable as hazardous and the degree of hazard. It is also important to consult the applicable MSDS when classifying hazardous waste.

Table 6: Hazardous waste classification examples

Waste Type	Waste Classification
Oil contaminated soil	Flammable solid
Workshop Wastes (Filters, oily rags etc.)	Flammable solid
Contaminated containers (paint, oil tins etc.)	Flammable solid
Used oil, petrol, diesel etc.	Flammable liquids
Fluorescent light tubes/bulbs (CFLs)	Health Hazards (Acute toxicity)
E-waste (batteries, ink cartridges, projectors, printers, computers etc.)	Health Hazards

As stated above the classification of hazardous waste must be done within 180 days of generation. It is recommended that hazardous waste be collected before the 180-day grace period and that a recognised service provider classifies the waste before disposal thereof. An agreement must be in place with the service provider detailing this.

Proof of such classification and safe disposal must also be provided.

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It must be noted that should the hazardous waste not be disposed of and classified as detailed above, the necessary steps must be taken to classify the hazardous waste on site according to the GHS before the 180-day grace period is reached. It shall be noted that TPD generate no waste that contain any PCBs.

7. TPD Waste Management Strategy/Rules

TPD has developed and implemented four environmental cardinal rules across its operations. The environmental cardinal rules apply to all TPD projects. The rules are rolled out to all new projects and the following process is followed:

- Train the trainer - project personnel shall be trained to ensure that the rollout to contractor staff is conducted as per specified training materials.
- Training packages as well as posters are issued to Eskom projects sites and the contractors.
- Posters shall be clearly displayed on site at locations which would ensure adequate visibility not only to staff but also to visitors. Site offices and other areas on site shall be used to display posters.
- Attendance registers of all awareness training shall be submitted to the relevant TPD Project Managers and Environmental Advisors.
- Eskom and Contractors shall incorporate the cardinal rules into daily risk assessments or environmental toolbox talks to ensure that continual awareness is conducted.

The cardinal rules are as presented in Figure 2 below.

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Figure 2: Eskom Transmission Projects Delivery – Environmental Cardinal Rules

The TPD Waste Management Strategy for solids and liquids aims to provide for waste minimisation, re-use and recycling strategies where sustainable, practical and feasible; to those associated waste with construction activities.

All initiatives shall be set-up to support the waste management strategy to ensure 'cradle to grave' management of these waste streams.

Waste Management Challenges

1. Registered landfill sites in close proximity to projects.
2. Timeous receipt of safe disposal certificates/proof or disposal from landfill sites.

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3. Registered recycling companies/facilities proximity to projects sites.
4. Return to supplier agreements for certain waste generated.
5. Medical waste collection and disposal at remote sites.
6. Poor on-site waste segregation practices.
7. Availability of weigh bridges at point of disposal.
8. Inadequate/lack of resource allocation.
9. Environmental human resources on sites.

7.1 General and hazardous management strategies

Table 7: Waste management practices and strategies

Waste	Prevention and/ reduction	Reuse	Recycle
Used oil	Timely servicing of equipment and ex-situ servicing/maintenance of vehicles	Taken to service provider (i.e. OilKol), used for fuel applications	Filtering
Batteries	Implementation of extended user responsibility; Proper maintenance of battery and ex-situ servicing / maintenance of vehicles	None	None
Printer cartridges	Printing when necessary	Re-filling or taken to service providers that will refill or resell	None
Fluorescent tubes	Implementation of energy efficiency directive (switch off when not in use) All fluorescent tubes are taken offsite for recycling.	None	None
Vehicle tyres	Implementation of extended	Some parts can	Metal recycling

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Waste	Prevention and/ reduction	Reuse	Recycle
	user responsibility ; Proper maintenance and ex-situ servicing/maintenance of vehicles	be used as second hand. Used as fuel in cement kilns	facilities Steel recycled and rubber turned into rubber crumb
E-waste	Implementation of extended user responsibility ; Correct handling/use of equipment and maintenance	None	None
Contaminated rags and PPE	Good housekeeping and use of correct cloth material; and following safe work procedures	None	None
Sewage	Use of water-efficient ablution facilities	None	None
Oil contaminated soil	Correct use of drip trays, proper vehicle maintenance, Good housekeeping.	None	None
Oil filters and other chemical contaminated vehicle parts	Timely servicing of equipment and ex-situ servicing/maintenance of vehicles	None	None
Paint and paint containers	Good housekeeping and buying material in bulk packaging	None	None
Cement bags	Use of premixed concrete	None	None
Grey-water	Use of water-efficient ablution facilities	Use for construction purposes where viable	None

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Waste	Prevention and/ reduction	Reuse	Recycle
Herbicides and herbicide containers	Use of external service provider; Buying material in bulk packaging and use of correct quantities needed for the task	Re-use of less hazardous containers	None
Medical waste	Following safe-work procedures	None	None
Paper (i.e. boxes)	Implementation of extended user responsibility ; Buying material in bulk packaging ;promote/use of soft documents copies and both sides printing	Use one sided printed pages for faxing or scribbling	Recycle to produce tissue, toilet paper, newspapers and egg trays
Plastics	Buying material in bulk packaging	None	Used to generate electricity at waste and energy plants. PET used in the manufacturing of soft drink and fruit juice bottles, pillow HDPE manufacture milk containers, shopping bags
Wood and cardboard	Implementation of extended user responsibility	Used to make benches, tables, Wendy houses and decks	None
Glass	Following safe-work procedures	Can be used in manufacturing of	Sorted into colour streams of amber,

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Waste	Prevention and/ reduction	Reuse	Recycle
		bricks	white and green to make cullet
Cable offcuts & scrap metals (i.e. steel members)	Correct handling of material and good housekeeping	None	None
Building rubble/dry concrete	Following specification to avoid destruction of structures due to poor quality	Re-filling degraded areas, road maintenance	Recycled into low strength concrete or road base
Organic waste (Food waste)	Preparing food in amounts needed for consumption	None	Used for composting and mulching Can also be used for piggery
Washed cement bags	Use of premixed concrete	None	Paper recycling industry
Glass/Porcelain insulator	Following safe-handling procedures to avoid damage	None	Glass recycling companies

7.1.1 Methodology

7.1.1.1 Waste Avoidance and Reduction

The aim of waste avoidance and reduction is to achieve waste minimisation and therefore reduce the amount of waste entering the waste stream. This is especially pertinent for some waste streams where the recycling, recovery, treatment or disposal is of a challenge.

TPD contractors with the assistance of projects management shall include targets and measures for waste minimisation and recycling, and set out performance monitoring systems for measuring progress against targets as part of site specific waste management plans.

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7.1.1.2 Reuse, Recycling and Recovery

Separation at source is an important means to improve both the quantity of recyclables, and reduce the volume of waste sent to landfill. Separation at source will also result in a better quality of recyclable materials in terms of lowering contamination levels.

TPD contractors shall be expected to implement waste segregation to achieve the above. To this effect sites shall establish realistic and defensible targets and measures for reduction, re-use and recycling of waste. All the records relating to these shall be sent to TPD Grids' Senior Environmental Advisors. Licensed/permitted waste management facilities shall be used for this purpose.

7.1.1.3 Storage, Collection and Transportation of Waste

This shall be done in compliance to Part 5, Section 21 – 25 of the NEM: WA. Depending on the quantity and the remoteness of the areas where projects are, in some instance waste is kept on sites for more than 180 days after generation. In many instances it does not make any business sense to transport small quantities. Projects are therefore allowed to keep waste on site, as long as pollution preventive measures are in place (i.e. closed containers, placed on a bunded surface and avoid cross contamination).

Storage containers / waste receptacles shall be labelled. Considering the quantities generated only those that are generated in large quantities (i.e. Asbestos) are properly labelled as per regulations while other waste receptacles only have waste type or stream (i.e. labelled as hazardous, general, steel scrap and garden waste).

Littering on site shall not be allowed and contractors will be expected to set up monitoring programs for litter and to implement control measures appropriately. Storage of waste shall be done in such a way that it does not result in nuisance and health hazards.

All waste contractors transporting hazardous waste will be required to provide Eskom TPD with a route risk analysis and waste manifest procedure detailing the transportation, type of waste disposed of, quantities disposed of, and how and where the waste was disposed of, and by providing a certificate of disposal. The transport of waste must be in accordance with national and provincial legislation as well as municipal bylaws requirements. It shall be noted that most if not all TPD projects are not serviced by the municipalities. However, principal contractor is expected to have a service

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level agreement with waste collectors and transporters to service projects. The service providers shall be subjected to comply with relevant legal requirements.

Medical waste shall be handled and disposed of in compliance with Eskom Waste Management Procedure 32-245.

7.1.1.4 Disposal

Project Sites (Contractors' responsibilities) shall identify and list registered landfill sites in proximity to projects for use during construction. In the absence of a registered landfill site the contractor shall be expected to contract a licensed waste collector for the removal and disposal of waste from site. This is to ensure that only legally registered and accredited landfills and service providers are used.

The following waste types may not be disposed of at a landfill site from the following dates as per National Norms and Standards for Disposal of Waste to Landfill (GNR 636):

- Batteries – 23 August 2021
- Fluorescent lamps – 23 August 2016

National Norms and Standards for the Assessment of Waste for Landfill Disposal (GNR635) are not applicable to TPD waste streams. Only licensed waste transporters shall be used for collection and disposal waste.

Section 2(a) (iv) of the NEM: WA clearly indicates that *“the treatment and disposal of waste is a “last resort” within the hierarchy of waste management measures”*.

Contractors shall be expected to provide safe waste disposal certificates/waste manifests as evidence of treatment, processing and disposal of waste from sites. This is to guarantee that waste disposal takes place in accordance with the principles of environmental justice and equitable access to environmental services as articulated in the NEMA.

7.1.2 Liquid Waste Handling

- All liquid waste is also managed by the contractors at TPD sites. Comprehensive method statements are prepared by the contractor in order to show the commitment and the ways as to

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how sewerage shall be managed on sites.

- All mobile toilets shall be fastened to the ground to avoid being tipped over by wind or by animals (cattle livestock and game depending on the site).
- All service providers that have to collect and transport, and dispose of the sewerage, grey water or any other liquid waste from TPD Projects Sites shall be registered and permitted/licensed to perform such duties according to the national and provincial legislations.

8. Monitoring and Management

A programme for monitoring implementation of the plan has been designed and shall be implemented. The programme includes amongst others the following:

- Schedule for monitoring (monthly, quarterly, biannually, annually, etc.); Monthly report of waste statistics as per TPD procedure – all waste stats to be reported to Transmission division office.
- Monthly Waste disposal figures shall be monitored, analysed and reported in accordance with Eskom Corporate requirements and legal requirements. A waste register is filled in and is based on disposed amounts from waste manifests received from the Contractor. The Data shall be captured on the Waste Monthly Register (240-47176064).
- Auditing and data integrity – this will be done by TPD Head Office for all Grids.

9. Acceptance

This document has been seen and accepted by:

Name	Designation
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10. Revisions

Date	Rev.	Compiler	Remarks
November 2021	04	Lené le Grange	Addressing gaps identified during audit
July 2021	03	Lené Grobbelaar	Document needed revision
January 2017	02	Lené Grobbelaar	Addressing changes in legislation and gaps identified during audits
December 2013	01	Tshinanne Mutshatshi	New Document

11. Development Team

The following people were involved in the development of this document:

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12. Acknowledgements

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